REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-9 are in the case.

I. ELECTION/RESTRICTIONS

The election of Group I (claims 1-9) is affirmed. Claims 10 and 11 have been canceled without prejudice to the possibility of pursuing that subject matter in a separate divisional case.

II. THE OBVIOUSNESS REJECTION

Claims 1-9 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over EP 1043064 to Ellis *et al.* (Ellis). That rejection is respectfully traversed.

As claimed, the invention provides a catalyst composition for the oxidation of ethane and/or ethylene to acetic acid. The composition comprises in combination with oxygen the elements molybdenum, vanadium, niobium and gold in the absence of palladium according to the empirical formula: $Mo_aW_bAu_cV_dNb_eY_f$(I), wherein Y is one or more elements selected from: Cr, Mn, Ta, Ti, B, Al, Ga, In, Pt, Zn, Cd, Bi, Ce, Co, Rh, Ir, Cu, Ag, Fe, Ru, Os, K, Rb, Cs, Mg, Ca, Sr, Ba, Zr, Hf, Ni, P, Pb, Sb, Si, Sn, Tl, U, Re, Te and La; and a, b, c, d, e and f represent the gram atom ratios of the elements such that: $0 < a \leq 1$; $0 \leq b < 1$ and $a + b = 1$; $10^{-5} < c \leq 0.02$; $0.4 \leq d \leq 0.865$; $0.135 \leq e \leq 0.23$; and $0.55 \leq d + e \leq 1$; and $0 \leq f \leq 2$.

In the claimed catalyst composition, vanadium is present in gram atom ratio "d" and niobium is present in the catalyst composition in gram atom ratio "e", where $0.4 \leq d \leq 0.865$, $0.135 \leq e \leq 0.23$ and $0.55 \leq d + e \leq 1$. The amounts of vanadium and niobium

are such that an increased selectivity to acetic acid (at the expense of ethylene) is achieved in the oxidation of ethylene/ethane to acetic acid and ethylene. This is unpredictable and is not suggested by Ellis.

In Ellis, vanadium is present in gram atom ratio "d" and niobium is present in gram atom ratio "e", where $0<d\leq 2$, preferably $d>0.1$ and $0<e\leq 1$, preferably $e>0.01$. The Action asserts that since Ellis discloses that d may be > 0.1 and e may be > 0.01, the selection of each specific ratio of d and e would be well-understood to be result-effective variables, especially when attempting to control selectivity of the oxidation process. From this, the Action concludes that it would have been obvious to select the suitable range of each value of d and e in the prior art catalyst composition by routine experimentation to arrive at the claimed invention. This position is respectfully traversed.

There is nothing in Ellis which discloses or suggests that selection of specific gram atom ratios for vanadium and niobium could have any effect on ethylene or acid selectivity in the oxidation of ethylene/ethane to acetic acid and ethylene. In particular, there is no suggestion in Ellis of a catalyst composition comprising the combination of vanadium in a gram atom ratio of between 0.4 and 0.865 and niobium in a gram atom ratio of between 0.135 and 0.23. Furthermore, there is no suggestion in Ellis of a catalyst composition wherein the sum of the respective gram atom ratios of vanadium and niobium is between 0.55 to 1, as presently claimed.

Moreover, Ellis actually discloses that its catalysts provide high selectivities to both acetic acid and ethylene (Ellis, page 3, lines 12-13). Comparison of Experiments A-E with Examples 1 and 2 of Ellis (Table 1) demonstrates that the catalysts of Ellis

achieve high selectivities to both ethylene and acetic acid, with a reduction in carbon oxides. The present invention, on the other hand, is concerned with improving selectivity to acid to the detriment of ethylene. There is no suggestion in Ellis that high selectivity to one product could be achieved over the other. Ellis in fact leads away from the present invention as Ellis does not intend to improve selectivity to acid over ethylene or vice-versa, but rather only to improve the selectivity of **both** acid and ethylene at the expense of carbon oxides.

In Table 1 of the present application (see page 11), catalysts B and C of the present invention provide selectivity to acetic acid of 74.5 and 80.8 respectively and ethylene selectivity of 9 and 0 respectively (at ethane conversion of 4.6 and 4.1%), whereas at a comparable ethane conversion (4.5%), comparative catalyst 3 achieves only 51.3% selectivity to acetic acid and a selectivity to ethylene of 31.6%. Thus, the catalysts according to the present invention are significantly more selective to acetic acid under comparable reaction conditions.

In addition, a further experiment has been carried out (according to the method described in the specification) wherein the ethane conversion was 4%. The results for Comparative Catalyst 1 (which is a catalyst composition as defined by Ellis) and Catalyst A are as follows:

	Sel. To Acetic Acid	Sel. to Ethylene
Comparative Catalyst 1	53.4	30.8
Catalyst A	72.0	0

This experiment demonstrates that a catalyst according to the invention is highly selective towards acetic acid and not ethylene compared to the comparative catalyst 1. This is unexpected and could not have been predicted by one of ordinary based on Ellis. Should the Examiner wish to have the data discussed on the present response presented in Rule 132 declaration format, it is requested that the undersigned be so advised.

In light of the above, it is clear that Ellis does not give rise to a *prima facie* case of obviousness of the presently claimed invention. The catalysts according to the invention are surprisingly more selective to acetic acid under comparable reaction conditions. Such selectivity towards acetic acid could not have been predicted by one of ordinary skill based on Ellis. Ellis therefore does not give rise to a *prima facie* case of obviousness. Withdrawal of the obviousness rejection is respectfully requested.

Favorable action is awaited.

Respectfully submitted,

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